HOW TO DESIGN ASSESSMENTS FOR LEARNING

KAY SAMBELL

This guide describes a method for creating effective assessments aligned with learning outcomes.

Watt Works Quick Guide #21, which introduces the principles of Assessment for Learning, argues that assessment is more than simply marking and grades for students' assignments: instead, it is a holistic process by which students are actually learning though assessment, leading to significantly better achievement and long-term outcomes. One benefit of the approach is that assessment and feedback processes can then become fully integrated into the learning and teaching, rather than 'stuck on' as an afterthought.

This guide describes one method for developing effective assessments that can work in tandem with teaching and learning activities to help students learn and improve. It focuses, particularly, on trying to make our assessments more **authentic**, in order to fuel our students' deep and long-term approaches to learning (Sambell et al, 2013). Authentic assessment directly relates to things that people do in the professional, industrial or commercial world, where their knowledge, skills and attributes can be honed, used and applied (Villarroel et al, 2018).

But we need not assume that authentic assessment is simply synonymous with employability or the world of work. Authenticity can be associated with sparking a student's sense that the assessment you have set is inherently worthwhile, because your assessment design helps them to perceive the links to the everyday life, work and practices of the subject community and its ways of thinking and practising, or because it has some personal meaning (Arnold, 2021).

HOW CAN WE DESIGN TASKS THAT FULLY INTEGRATE ASSESSMENT WITH LEARNING?

Whenever writing assignments, it is a good idea to start with the **learning outcomes**. By creating assessments based on the learning outcomes, you are building assessment firmly into the course or programme, and you can ensure that students' energies are all directed towards the same learning goal. If the learning outcomes are well written, they are likely to contain one or more powerful, driving **verbs** at their centre to direct student effort, such as 'interpret', 'research and review', 'set up and calibrate', 'evaluate' and 'compile'.

Using the learning outcomes as a basis, you can begin to create your assessments by adding a few extra elements:

- The **object** of the verb (i.e., what you do)

- The **outcome/evidence** that demonstrates that students have achieved what they were supposed to.

You can see what this process might look like in the table below:

Verb/educational outcomes	What? i.e. object	Outcome/evidence of achievement
Interpret	A range of complex and at times incomplete financial and other data.	Compile a meaningful summary leading to a forward action plan.
Research and review	Information from a variety of sources including press releases, statistics from national agencies, focus groups and advisory boards and others.	Produce an accessible executive summary of the key findings in the form of two sides of A4.
Familiarise yourself with technical set up and calibration	Specialist equipment.	Draw up a quick guide for peers who will be using the equipment.
Evaluate	Three proposed solutions to a complex issue.	Formulate a further two of your own with suggestions as to what might work best, and why.
Compile	Contingency plans for use in a professional environment.	Produce disaster recovery plan in case of a serious emergency leading to mitigations and remediation.

Next, you could begin to make your assessment tasks even more authentic and realistic by devising:

- A **context** to the assignment, which is relevant to your subject area (e.g. relevant to your discipline community, or your professional practice, or to societal issues or challenges)

- Some context-specific **modifiers/developments/range statements** which give students clear and helpful guidance on what you are asking them to do.

You can see examples of what this might look like in the table below, in which illustrative contexts and modifiers have now been added into the total assessment design process.

Context relevant to your subject area	Verb from learning outcome	What? i.e. object	Outcome/evidence of achievement	Modifiers/ developments/ range statements (context specific)
You are working for a social enterprise which is struggling to maintain momentum during the Corona19 crisis.	Interpret…	…a range of complex and at times incomplete financial and other data.	Compile a meaningful summary leading to a forward action plan…	…that will give your funders confidence in your abilities to remain viable
You work as an advisor for a political think tank devising policy for ministers.	Research and review…	…information from a variety of sources including press releases, statistics from national agencies, focus groups and advisory boards and others.	Produce an accessible executive summary of the key findings in the form of two sides of A4…	…for your minister and the team supporting them.
The lab where you work has taken delivery of a new microscope	Familiarise yourself with technical set up and calibration…	…of specialist equipment.	Draw up a quick guide for peers who will be using the equipment…	…to enable them to use it independently, safely and appropriately.
You are working with a business that owns, lets and services commercial premises in the city centre.	Evaluate…	…three proposed solutions to a complex issue.	Formulate a further two of your own with suggestions as to what might work best, and why…	…that will enable your company to decide about new acquisitions and divesting of assets.
You are a hydrologist working for a regional development agency with responsibility for a substantial river basin.	Compile…	…contingency plans for use in a professional environment.	Produce a disaster recovery plan in case of a serious emergency leading to mitigations and remediation…	…in the event of a serious flooding incident that affects more than 50% of your area.

WHAT MIGHT THIS LOOK LIKE IN PRACTICE?

The following are two illustrative examples of how the method just described can be used to replace traditional assessments with more learning-oriented assessments that can then become closely aligned to the teaching and learning activities.

An illustrative example from Electronic Engineering (adapted from a second-year undergraduate module led by Alistair Sambell, Huddersfield University)

Module Learning outcomes

Appraise the common communication technologies, identifying key performance features.

Analyse the performance of common analogue and digital communications systems.

Design a simple communication system for a practical situation, defining the required sub-systems and evaluating applicable technologies.

The traditional assessment that was replaced in this instance was an exam, which gave students questions based on calculations to analyse a system.

The newly-designed assessment or learning approach was broadly as follows:

CONTEXT

In your role as a qualified engineer, you have been asked to produce a feasibility study for a dedicated, secure and robust internal data link for a manufacturing company that operates across two sites, separated by a distance of 1 mile.

TASKS

- Devise a question list that will form the basis for the system specification. In other words, what information will you need to know to allow you to design a system? This should include technical parameters such as the type and quantity of data, number of users, mobility and security requirements, alongside practical considerations such the physical environment it will operate in, expected system lifecycle and cost. Your list should be compiled as a simple A4 table of questions, and you may wish to add options for the answers where appropriate. These questions will form the basis for a class discussion in which we will agree the detailed design brief.

> This gave students a formative opportunity to brainstorm and discuss their ideas. The teacher's aim was to focus their attention on questions of problem-definition at an early stage in the module (as opposed to moving too quickly to an elegant but decontextualized solution). As they began to engage with and discuss the problem itself, they gained informal feedback via participation from teachers and peers in class time.

- Based on the design brief we have agreed in class, identify the advantages and disadvantages of three quite different approaches to the communication link (for example analogue and digital, wired and wireless). You should produce a short (maximum 6 slides) Power Point report that summarises your analysis. You may also want to highlight any areas in which you think the design brief is incomplete or contradictory. You will have three minutes to present these to the class [30%]

> This aspect of the overall assessment design was carefully sequenced. It involved students in peer review processes (peers giving constructive feedback not marks); enabled them to discuss and apply the stated criteria to their own work and that of others; enabled the teacher to give 'just-in-time' live actionable feedback in class time to help students gauge their progress and take future action.

- Following your presentation and class discussion, select one of the approaches you have identified and design a system for the company. You should use a mathematical modelling package (eg Matlab) to analyse and verify the key performance parameters, including the expected reliability of the link. You should consider practical implication such as cost and environmental impact. You should present your work in the form of a short (4 pages of A4 maximum) report written for the company board. The report should demonstrate why you have selected your preferred design, the anticipated performance based on your modelling, and the practical aspects of introducing the system for the company. Include a 500-word reflection on how you engaged with feedback exchanges from your presentation and in-class activities [70%]

> Once students have been actively involved in rich feedback opportunities which they were required to engage with throughout the course of the module, the need for extensive commenting post submission - when students are less likely to be able to take immediate action - could be significantly reduced.

An illustrative example from Psychology (adapted from ideas provided by Julie Hulme (National Teaching Fellow), Keele University)

The traditional assessment was an essay question for first year psychology students:

"Discuss the ways in which inter-group conflict can arise and be reduced within a community using social psychological theories."

The more authentic assessment used a case study:

CONTEXT
"You are working with a local housing association, and your job is to try to create a sense of community in a small new social housing development in Stoke-on-Trent. The community is home to diverse people, including single people, families, young and old, from lots of different ethnic backgrounds and cultures. In general, everyone has started to settle in well, but you have noticed that there are some tensions arising between the younger residents (mostly care leavers aged 16 to 25) and the older residents (retired people who are mostly over the age of 60). Some younger residents complain that the older residents are nosey, always wanting to know what they're doing, while some older residents complain that the younger residents are always rushing about and can be noisy".

TASKS

- Use your understanding of social psychological theories studied in this module to write a short account to explain why this problem might have arisen (500 words).

- Propose one way in which you could help to resolve the conflict and help to restore community relations (500 words).

- These two elements should be presented in the form of a report that will be useful for other staff at the housing association.

- Provide an annotated reference list, which shows the main sources you used to find the information, and gives a concise summary of the key message from one paper or book chapter that was important to writing your report (full reference list in APA format plus up to 500 words description for your main sources).

- Write a short personal reflection (300-500 words) in which you outline what you have learned about resolving intergroup conflict, and how this might influence your current and future practice.

You can see many more worked examples in "A compendium of examples of authentic assessment in practice from diverse disciplines" (March 2021) and its follow up companion (May 2021) created by Sally Brown and Kay Sambell in their Covid collection of open resources at *https://sally-brown.net/kay-sambell-and-sally-brown-covid-19-assessment-collection/*

WHY USE THE APPROACH DESCRIBED IN THIS GUIDE?

It's relatively straightforward, particularly in applied and professional disciplines, to come up with realistic and relevant scenarios to which students can relate. However, designing appropriate activities and questions to accompany them can be seen as time consuming and challenging. Using this approach, because the central verbs, objects and outcomes / evidence of achievement are likely to be constant year on year, designing new assignments with similar kinds of associated tasks is likely to be quite straightforward when linked to new topical scenarios year on year, or the scenarios could remain similar, but with different associated tasks again reflecting the learning outcomes.

Designing assignments then doesn't have to be hugely demanding and taxing if it is tackled systematically and thoughtfully (and ideally, collectively) and can unlock assessment designers' potential to be more creative in designing alternative tasks, while being mindful of the workload. It's a sensible idea to start with relatively small changes until you build your confidence. It's also important to think about how any changes you make fit within a student's overall assessment diet. This will enable you to help learners see how their learning journey fits together overall, and how they will be supported (e.g. through briefings, activities and embedded feedback processes) to get to grips with the kinds of assessment tasks they'll encounter, and to see why the tasks will help them become better learners, both now and in the long run. A co-ordinated approach across a programme is ideal.

What kinds of evidence could students be asked to supply within authentic assessment tasks?
There are myriad means by which you can ask your students to evidence their achievements: in-class presentations, portfolios, logbooks or assessed notebooks, viva voce exams/ orals, assessed seminar and group discussion records (video or audio), lab work reports, conference posters, checklists, narrated PowerPoint presentations, reflective commentaries/ accounts, critical incident accounts, mind maps, flow charts, electronic and hard-copy portfolios, teaching packs, information display materials, projects, case studies, annotated bibliographies, mind maps, sketch notes, story-boards, articles or chapters for publication, artefacts and, of course, formal and short reports.

Have a look at Sambell and Brown (2020c) to explore the pros and cons of some of these alternatives in a post-pandemic context: particularly the table of alternative methods which gives an overview of different methods, together with advantages, disadvantages, and points to bear in mind for each method. More ideas, presented by Arnold (2021) in a very accessible format for busy practitioners, can also be found and downloaded free-of-charge at the following website: **Authentic Assessment Top 'Reflective' Trumps! – Lydia Arnold**

How you choose to put this into practice will depend on the context, the discipline, the level of study and most importantly, your purposes in assessing students on this occasion. Choose what outputs work best for you, aiming to make the assignment format fit your aims. It's important to plan your designs within the constraints that are part and parcel of your immediate learning and teaching context, and to remember that small adjustments can reap big rewards in terms of benefiting student learning. Simply stating an appropriate intended audience for the work can have a powerful and positive effect on how students respond, but it's important to help them see and discuss concrete examples of the types of outputs you are expecting, so that they are well-prepared.

Who can help me design authentic assignments that are fit-for-purpose?

Rather than struggling alone to produce authentic examples, it's a good idea to tackle this with colleagues within your own programme team or indeed in other related disciplines across Heriot-Watt and across your wider subject-related networks.

It's also a good idea to seek feedback from some students – maybe those who have formerly had experience of studying the subject area of your assessment tasks redesigns – as they will be well placed to advise you of any potential problems you haven't spotted, as will your HWU Effective Learning Advisors, who will be able to update you on the issues students frequently struggle with.

REFERENCES AND FURTHER RESOURCES

Arnold, L. (2021) Authentic Assessment Top Reflective Trumps. Available at: https://lydia-arnold.com/2021/04/08/authentic-assessment-top-reflective-trumps-cards/amp/ (contains a host of practical suggestions to reflect on and adapt: suitable for diverse disciplines)

Brown, S. and Race, P. (2020) Using effective assessment to promote learning, in Hunt, L and Chalmers, D. eds. *University Teaching in Focus: a learning-centred approach,* Abingdon: Routledge. (in press). (Contains a useful table of pros and cons on different modes of assessment)

London School of Economics and Political Science Assessment Toolkit (guide to developing assessment methods , including inclusivity and accessible assessment designs; diversifying assessment; assessment methods; selecting methods based on skills) Available at https://info.lse.ac.uk/staff/divisions/Eden-Centre/Assessment-Toolkit

Sambell, K. and McDowell, L., (1998) The construction of the hidden curriculum: messages and meanings in the assessment of student learning. *Assessment & Evaluation in Higher Education, 23*(4), pp.391-402.

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Sambell, K., Brown, S. and Race, P. (2019) Assessment as a locus for engagement: priorities and practicalities. *Italian Journal of Educational Research,* pp.45-62.

University College London Teaching Toolkits (practical resources on assessment and feedback). Available at: https://www.ucl.ac.uk/teaching-learning/teaching-resources/teaching-toolkits

Villarroel, V., Bloxham, S., Bruna, D., Bruna, C., & Herrera-Seda, C. (2018). Authentic assessment: creating a blueprint for course design. *Assessment & Evaluation in Higher Education, 43*(5), 840-854.

Villarroel, V., Boud, D., Bloxham, S., Bruna, D. and Bruna, C. (2020) Using principles of authentic assessment to redesign written examinations and tests. *Innovations in Education and Teaching International, 57*(1), pp.38-49.

The following articles in support of this approach can be found at https://sally-brown.net/kay-sambell-and-sally-brown-covid-19-assessment-collection/

Sambell, K. and Brown, S. (23 March 2020) 'Contingency-planning: exploring rapid alternatives to face-to-face assessment'.

Sambell, K. and Brown, S. (2 April 2020) 'Fifty tips for replacements for time-constrained, invigilated on-site exams'

Sambell, K. and Brown, S. (1 June 2020) 'The changing landscape of assessment: some possible replacements for unseen time-constrained face-to-face invigilated exams'

Brown, S. and Sambell, K. (17th August 2020) 'Writing Better Assignments in the post-Covid Era: approaches to good task design'

Brown, S. and Sambell, K. (21st August 2020) 'Changing assessment for good: a major opportunity for educational developers'

Brown, S. and Sambell, K. (19th March 2021) 'A compendium of examples of authentic assessment in practice from diverse disciplines'

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CONTACT US
E: LTAcademy@hw.ac.uk

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